The future of our electricity network

Consultation to engage communities in future DSO strategy

WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Version Control

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Photo credits

WPD would like to thank and credit ***South West Water*** and ***Regen*** for use of their images and graphs.

What we mean when we talk about …

Aggregation: 'Bundling' smaller flexibility services into a portfolio, which can participate in programmes with entry thresholds that are too high (i.e. 1 MW), aggregators have market knowledge and often stack revenue.

Balancing: system balancing is about ensuring the supply and demand on the electricity system is equally matched and operating within technical limits, i.e. the right frequency.

BEIS: is the Department for Business Energy and Industrial Strategy.

Business as Usual: DNOs test and pilot ideas to improve the energy system through innovation trials and then roll out successful ideas to their whole network which we call business as usual (BaU).

Constraints: Congestion on the network that is area specific and approaching network capability. Local network constraints must be managed (demand-generation or generation-demand < network capabilities).

Demand Side Response (DSR): Intelligent energy use. It enables businesses and consumers to save on total energy costs by increasing, decreasing or shifting their electricity consumption at specific times in response to a signal. For example, charging an electric car using a smart charger that charges the car when it's best for the network and cheaper for the driver, or a supermarket turning off freezers from 5-6pm to avoid the evening peak.

DERs: Distributed Energy Resources, assets connected to the distribution network that could be called upon to provide flexibility services.

DNOs: Distribution Network Operators, the six regional companies licenced to distribute electricity within 14 defined licence areas across GB.

DSOs: Distribution System Operators, the evolving role of DNOs to "…operate and develop an active distribution system comprising networks, demand, generation and other DERs."

Electricity System Operator (ESO): Is responsible for the day to day operation of the system and keeping the wider system in balance. In GB this role is part of National Grid, in this document we will refer to them as the ESO.

Flexibility: Is the ability of a power system to operate stably as demand and supply fluctuates, using a diverse range of actions provided by the system itself and its connected parties.

Flexibility services: P roviding a Demand Side Response service by modifying generation and/or consumption patterns in reaction to an external signal for a financial reward (revenue).

MW: A megawatt is a unit for measuring power that is equivalent to one million watts.

MWh: A megawatt hour is equal to 1,000 kilowatt hours (kWh). It is equal to 1,000 kilowatts of electricity used continuously for one hour.

Network capacity: The ability of a network to accommodate peaks in demand and/or generation. Spare capacity is the network capability to have more large-scale developments connected to major substations.

Network reinforcement: When we upgrade or install new equipment to make our network more secure and able to accommodate new generation and demand.

Ofgem: The UK energy regulator.

Revenue stacking: Using assets to access multiple incentive programmes, paid for services or contracts – i.e. national balancing and local flexibility services.

Contents

1	**Introduction and objective of this consultation**	5
2	**An introduction to DSO**	8
3	**What DSO might look like in practice**	16
	Open LV	17
	Electric Nation	18
	Visibility Plugs and Sockets	19
	Flexible Power	20
	Entire	23
4	**Consultation Section 1: About you**	21
5	**Consultation Section 2: WPD's DSO principles**	22
6	**Consultation Section 3: Flexibility services**	23
7	**Next Steps**	30

Figure 1. Regen and WPD communities site visit to Project SCENe in Nottingham July 2018.

1 Introduction and objective of this consultation

Western Power Distribution (WPD) is the Distribution Network Operator (DNO) for the Midlands, South West England and South Wales, and is responsible for delivering electricity to approximately 7.9 million customers in the UK. WPD's core goals are safety, customer service, reliability, the environment, and value for money.

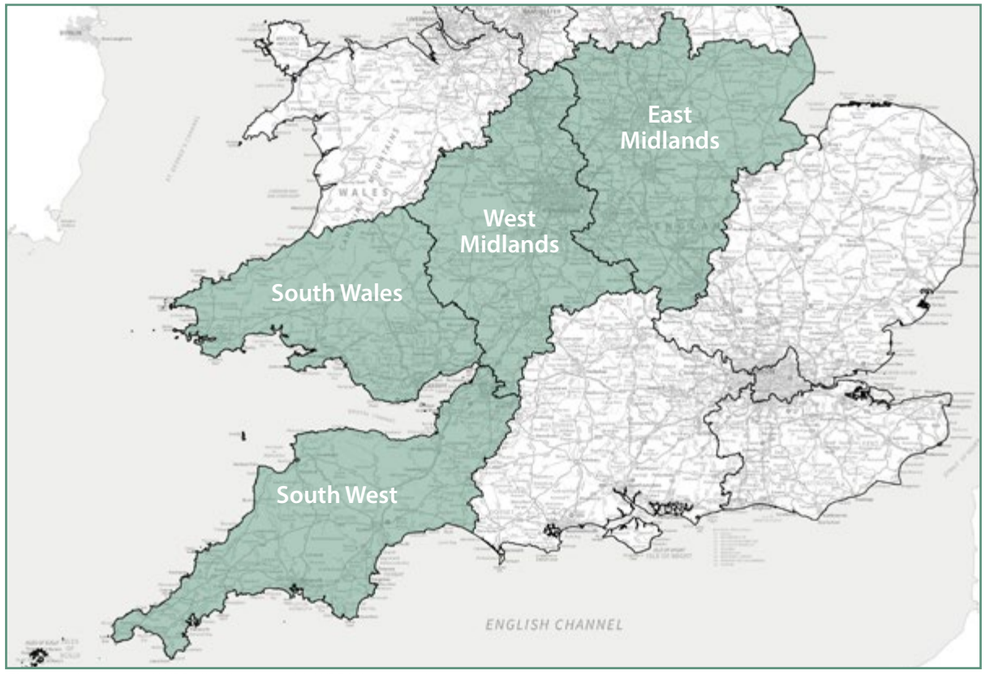
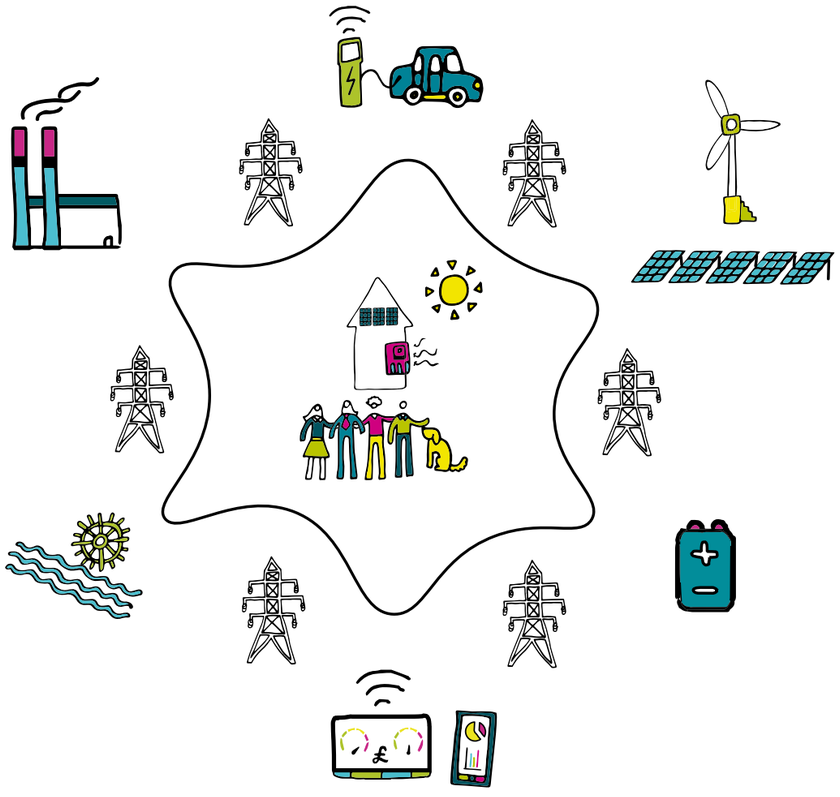


Figure 2. Area map of WPD distribution, with WPD's four supply areas.

WPD is carrying out substantial stakeholder engagement on the shift in its role to becoming a Distribution System Operator (DSO) and the role of flexibility in managing the network. There is more information on what this means in WPD's December 2017 DSO strategy which is available to view here. WPD recognises that one size does not fit all, so this consultation is targeted at community energy organisations and local energy stakeholders.

In this consultation paper WPD:

- sets out the key areas of the shift to DSO and development of flexibility markets
- sets out what we think this will mean for community energy groups and local energy stakeholders
- invites feedback through an online questionnaire on what matters most to community energy groups and local energy stakeholders.



> *Our energy landscape is evolving at a rapid pace and communities will play an increasingly important role in this. Through our ongoing work with community groups we know that they have a huge contribution to make and that the more WPD can do as a network and system operator to raise understanding and increase participation, the better the outcomes will be for all of us.*
>
> **Alison Sleightholm, Resources and External Affairs Director, Western Power Distribution**

Objective of this consultation

This consultation aims to:

- support community energy organisations to develop knowledge about our changing energy system and encourage informed participation
- find out what communities think and what their future energy plans are, and;
- use this information to inform WPD's ongoing engagement and capacity building support for community and local energy stakeholders going forward
- ensure WPD's vision for DSO is aligned with the needs of customers and stakeholders.

WPD will use the information gathered during this consultation to refine the implementation of the DSO strategy, understand where the gaps are, and shape future community engagement work. Feedback will also contribute to the design and development of flexibility products and enable WPD to identify whether a tailored offering is necessary for communities to ensure they can access the market.

WPD welcomes engagement and input from a wide range of organisations, with the potential to arrange follow-up phone interviews. This consultation sits alongside workshops on DSO and flexibility we are holding with community and local energy stakeholders in each of our licence areas.

WPD would like to thank you for your time responding to this consultation.

Why are DNOs becoming DSOs?

The electricity system is changing rapidly; more people are generating their own renewable energy and using electricity differently to address climate change.

As more renewable energy generation and low carbon technology is connected to the local distribution network, and as peak electricity demand and overall consumption rises (due to electrification of heating and transport), DNOs need to forecast and actively manage energy flows across the network.

A typical electric car uses as much electricity in a year, as an average home, so could alter the load profiles our network was designed for.

DNOs are transforming to become DSOs to enable a smarter electricity network that can cope with greater demand, enable more variable generation and storage to be connected, and deliver more choice and value to customers and communities.

In 2014 WPD started roll out of alternative connection options, including demand and storage connections. These will be offered to customers as standard across all WPD areas in the future.

By 2020 the government's smart meter programme should enable WPD to use household energy data to inform network decisions more effectively.

By 2030 customers could be using one of the 1.6 million domestic electric vehicle chargers, or some of the 8GW of storage expected to be installed in WPD's area.

What is a DSO?

The Energy Networks Association (ENA) Open Networks Project involving all the DNOs and National Grid, has published this definition:

"A Distribution System Operator (DSO) securely operates and develops an active distribution system comprising networks, demand, generation and other flexible distributed energy resources (DER). As a neutral facilitator of an open and accessible market, it will enable competitive access to markets and the optimal use of DER on distribution networks to deliver security, sustainability and affordability in the support of whole system optimisation. A DSO enables customers to be both producers and consumers, enabling customer access to networks and markets, customer choice and great customer service.

DSO roles and responsibilities:

- *Maintain distribution network resilience and security*
- *Support whole system stability*
- *Provide fair and cost-effective distribution network access*
- *Provide capacity in an efficient, economic, coordinated and timely manner*
- *Support whole system optimisation*
- *Enabling and facilitating competition in energy markets*
- *Provide and maintain systems, processes and data to facilitate markets and services."*

Electricity networks need to adapt to changing use

More homes and businesses are generating their own power, and the complex power flows are creating new challenges for the network. Uncertainty around increased demand and the uptake of low carbon technologies means flexibility is key. WPD will need more detailed visibility and intelligent control across the network. Smart meters installed in homes and businesses will provide valuable data required for the control of various technologies including electric vehicles. Managing the network in this way enables communities, homes and businesses to be flexible consumers and producers of energy.

In the future, customers could earn benefits from using energy at different times of the day. For example, a business that already generates its own energy from solar panels could install a battery to store and export power to the network when needed, or a home could change when they charge an electric vehicle and shift their demand to off peak periods. By having more visibility and control of the power flows on the network and avoiding costly infrastructure upgrades, WPD can connect customers more quickly and at a lower overall cost, ensuring a secure, low carbon and affordable electricity network for all.

> *The point about flexibility is to match the natural variability of renewable energy output plus changing patterns of energy use, the GB electricity system will need generation and demand to be much more flexible in the future. Sources of flexibility need to expand from the current providers of services to National Grid. WPD's aim is to increase the volume and diversity of flexibility sources, including from end customers and communities.*
>
> **Roger Hey, WPD Future Networks Manager, Western Power Distribution**

Flexibility is the ability of a power system to maintain stability as demand and supply fluctuate.

Between 2015 and 2023 WPD is spending £7.1bn on managing and upgrading network infrastructure.

£172m of this is being spent on reinforcements for low carbon technologies.

£50m will be used for smart grid technologies.

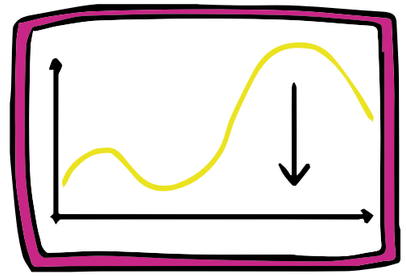
As customer energy use changes, WPD is looking at how electricity generation and demand on the network can be managed to avoid peaks, through behaviour change, education, incentives, battery storage and smart technologies.

In December 2017, WPD updated its DSO Strategy to reflect feedback from a wide range of stakeholders including customer groups, industry and local enterprise partnerships.

The strategy talks about:

- A more efficient, coordinated and cost-effective system
- A neutral market, WPD will facilitate competition in electricity supply, generation and flexibility services
- A more secure and resilient system locally which means even fewer power cuts
- More opportunities to collaborate and innovate
- More work on "non-network solutions" like energy efficiency and storage

> *We are beginning to signpost where the peaks and troughs are on our network across the year. We want to work with communities to share the benefits, if there is value to them and us.*
>
> **Ben Godfrey, WPD Network Strategy Team Manager, Western Power Distribution**



What does the DSO transition mean for community groups and local energy stakeholders?

More opportunities to engage and shape our energy system – WPD wants to find out how customers want to be involved. There will be even more opportunities to talk to WPD about collaboration and innovation, chances to learn and build skills and capacity together through pilot innovation trials and calls for flexible power in specific areas. WPD will continue to listen to customers, encourage greater involvement and better discussions that will influence network investment decisions and ensure we are delivering the network service that customers want. Find out more on the Community Energy pages of the WPD website.

We are here to talk to our customers and listen. If they have anything they would like to talk to us about they can talk to me as the community representative, they can call, email, come to our events or see us in person.

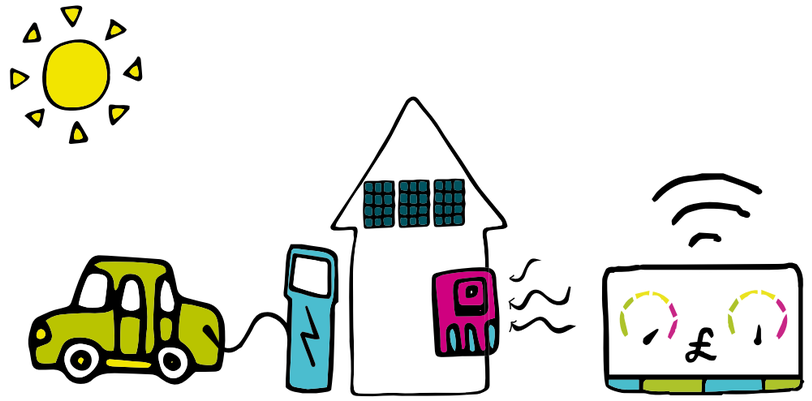
Yiango Mavrocostanti, Innovation and Low Carbon Networks Engineer, Western Power Distribution

The transition to DSO is a key area and shows DNOs are interested in working with communities. The local focus and window into future consumer trends means strategically it's a really important time for communities to be involved in DSO. For community organisations, it could mean new income and playing an intermediary role between many members and electricity networks. Communities have a capacity and skills gap, and groups will need support to develop the level of professionalism needed to participate and fill the capacity gap.

Jonathan Atkinson, founder of Carbon Co-op

A smarter system using new technology – in future, more homes will have smart meters and customers could be interacting with the energy system through their phone to see their electricity usage and cost in real time. This might affect how and when customers charge their electric cars, heat their homes, store and discharge electricity from batteries, and how they produce electricity using renewables. WPD is also adopting new technology to upgrade the distribution network infrastructure to better manage the flow of electricity on the network locally.

Better value for money – Anyone who pays an electricity bill contributes to the cost of running the network, so a more efficient and flexible network benefits customers. The alternative would be to spend millions on upgrading the network infrastructure to accommodate our maximum energy demand. Because there is uncertainty around how, where, when and how much electricity we will use in the future, using our network in a flexible way is a smarter solution. Conventional reinforcement will still be needed but in the short to medium-term, flexibility services may solve the constraint issues for a lower cost.

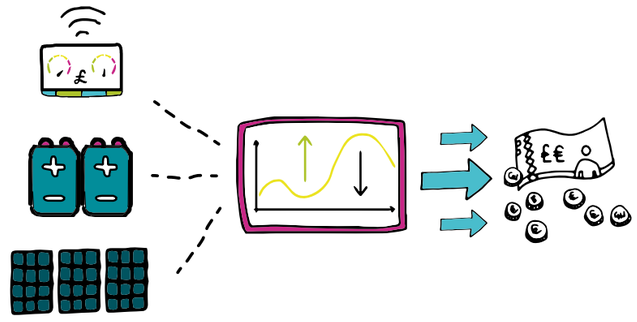


New income streams – some customers who take part in new flexibility markets will receive an incentive payment or reduce their energy bill. By taking part in Demand Side Response (DSR) services at peak times, in response to a signal from the DSO, these customers will be asked to:

- reduce their demand for electricity (a bit like Economy 7 but more dynamic)
- turn up their energy generation
- discharge power they have stored

This type of activity is already happening at a national level, through the Electricity System Operator (ESO) balancing services[1].

The Electricity System Operator is responsible for the overall operation of the electricity system. It is a separate company, owned by National Grid who also own the electricity transmission system.



WPD launched its first 'business as usual' tenders for flexibility across 18 zones on 20 June 2018. If you want to take part you need to be in one of the constrained areas where we are seeking flexibility services. WPD will be opening up network requirements to competition on a business as usual basis and is committed to openly test the market to compare relevant reinforcement and market flexibility solutions for all new projects of any significant value. We are now publishing signposting data using scenario forecasts to estimate future flexibility requirements across a five-year window. (www.westernpower.co.uk/signposting).

1 See National Grid DSR balancing service: https://www.nationalgrid.com/uk/electricity/balancing-services/demand-side-response-dsr

Here are some examples of what we think might work:

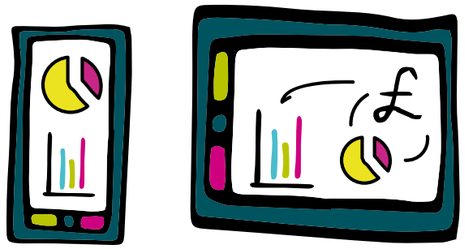
- Housing associations with homes that have electric heating or heat pumps which can be controlled remotely could help vulnerable customers to participate and save money.
- A community energy group might want to work with a technical specialist or aggregator to pool small and domestic loads to provide flexibility services to the DSO and be paid for this.
- Some household battery installers are looking at aggregating multiple household batteries to reduce use at peak times and discharge electricity when needed.
- Community energy groups and local energy stakeholders with renewable energy generation and electricity storage (for example wind/solar or hydro with a battery) that can turn up generation and discharge the battery when needed.

__Aggregators__ bring together multiple consumers to deliver a reliable flexibility service to the __electricity__ system

These new contracts are likely to be short term, perhaps for a couple of years, and the payments will not be enough alone to build a business case for investment in new energy assets, but they could be stacked with other revenue streams to generate additional income.

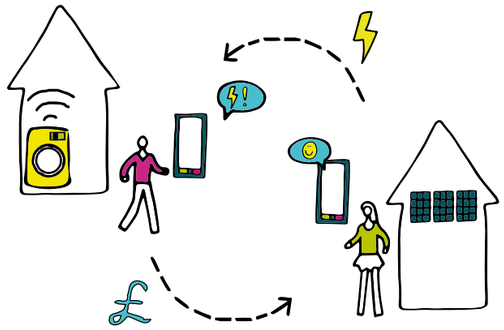
Access to other markets – The ESO already buys flexibility services from large scale generators such as windfarms, and large demand users like factories. This happens at a large scale and the contracts are complex. In future aggregators could help smaller demand and generation customers to access these markets. This would enable communities to provide flexible power to the ESO, the DSO and anyone else who wants to 'buy' the flexibility service, enabling communities to 'stack' multiple revenue streams together and generate more income from a variety of sources, creating a more robust business case.

New local energy market platforms and a step towards peer-to-peer trading – WPD has started buying flexibility services through flexible power, but the market is new and evolving, so there is an opportunity to influence the market structure and design now through this consultation. If, for example, there was evidence from the responses to this consultation that communities can and want to participate, WPD could consider a different consumer offering for communities to support participation in flexible power services.



Getting involved in flexibility markets could be a first step towards having the detailed understanding of energy flows and payment structures needed to sell energy locally. Some customers and community groups might interact through Local Energy Market platforms that are being developed with DNOs, such as the Cornwall Local Energy Market. These will display where there is congestion or capacity on the network and what services are needed. In future, the platforms could also support development of local energy tariffs and peer-to-peer trading. For example, if a school isn't using their solar on a Saturday, they could sell it locally using the same platforms that have been developed for local flexibility.

> *Future flexibility markets could provide exciting opportunities for communities. Customers will have an important role in shaping these markets by talking to us directly or through this consultation.*
>
> **Yiango Mavrocostanti, Innovation and Low Carbon Networks Engineer, Western Power Distribution**



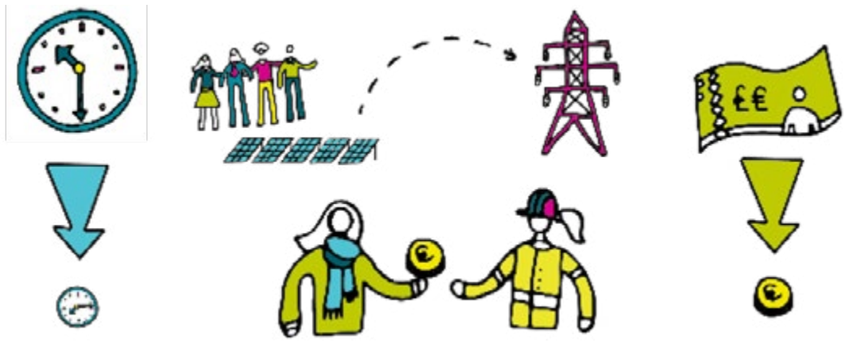
Faster and cheaper connections enabling more renewable energy to connect – Dynamic connections will be offered as 'business as usual' to enable more renewables to connect in constrained areas.

Flexibility markets will unlock network capacity, which will create space on the network to allow more renewable energy to be connected. New ways of connecting and using energy may allow for new assets to be connected.

__Barriers to Local Supply and Peer to Peer trading__ – To supply and sell more than 2.5 MW of electricity in the UK, you must have a supply license under current market rules set by Ofgem. The Energy Local trial in Bethesda, the Sunshine Tariff in Cornwall, and Smart Fintry in Scotland got around this by working with existing licensed suppliers.

A good practice case study

The Smart Energy Isles project will remove some of the barriers to installing renewable generation on the Isles of Scilly, and work with the overall Smart Energy Islands project to explore the benefits to fuel poor customers. Through the Social Energy Enterprise, locally generated energy will help address the higher than average fuel poverty on the Isles by reducing local customer bills.



More information clearly presented - WPD will be putting out much more information and signposting, for example, publishing capacity and flexibility maps (www.westernpower.co.uk/signposting) which could help localities plan how to make the most use of their local energy infrastructure when considering new developments or generation.www.westernpower.co.uk/signposting

3 What DSO might look like in practice

One way to get a better understanding of what the DSO transition might mean in practice is to look at WPD's **Future Networks Programme**.

The transition to DSO builds on WPD's research and innovation programme that tests new solutions before rollout to business as usual. This work includes:

- Alternative Connection options for customers to connect to the network in areas where capacity is constrained (i.e. where the connection can't happen without reinforcement)
- Forecasting, managing and dispatching demand and generation turn-up/turn-down services, allowing customers access to markets and revenue streams
- Testing new remote control, monitoring and telecommunications equipment to have better visibility of how the network is used
- Testing new equipment such as battery storage, vehicle-to-grid technology, and smart control systems that could support DSR.

WPD will continue to invest in research and innovation to find new solutions for the low carbon energy transition. Here are some examples of innovation projects WPD is doing now.

Open LV

Project name	Description of project	Impacts of project on community energy groups
Open LV **Company name** WPD **Project Partners** EA Technology, Nortech, Lucy Electric, CSE and Regen **Funding** Network Innovation Competition - £5.9 million **What?** Using LV substation data to build apps with communities to help balance the local electricity network **Where?** WPD licence areas: South West, South Wales, West and East Midlands **When?** January 2017 - April 2020 **More information** https://openlv.net/about/ https://www.cse.org.uk/news/view/2238	The OpenLV Project is managed on behalf of WPD by EA Technology. It is a relatively new trial, so results are not available yet. OpenLV aims to trial and demonstrate an open, flexible platform that could ultimately be used in every low voltage (LV) substation in Great Britain. The project is trialling software that allows the data from the local electricity network to be open access. The software has been designed to integrate with third party products to help the manage the electricity network at a local level. The software will be installed on 80 LV substations. The software measures and manages activity on each substation and will allow the substation to temporarily link with another substation to increase or release capacity depending on where the additional electricity demand is required. The OpenLV project is also focussing on engaging communities in the use of this data to improve the local electricity network flexibility.	The open access monitoring data on the low voltage network is a great opportunity for smart thinking and innovative with community groups. Seven community groups and 24 businesses have been selected based on their novel ideas for using this data. These ideas are mainly integrating the data into web based apps. The apps aim to engage people in the community with different aspects of local flexibility including local demand, generation and storage. The ideas range from identifying new business models, deployment of local tariffs, to raising public awareness around energy usage.

Photo credit: EA Technology and WPD

Photo credit: EA Technology and WPD

Electric Nation

Project name	Description of project	Impacts of project on community energy groups
Electric Nation **Company name** WPD **Project Partners** EA Technology, DriveElectric, Lucy Electric and Gridkey **Funding** Network Innovation Allowance (NIA) - £5.8 million **What?** Equip Distribution Network Operators with tools and solutions to enable them to manage plug-in vehicle market growth **Where?** WPD licence areas: South West, South Wales, West and East Midlands **When?** April 2016 - October 2019 **More information** http://www.electricnation.org.uk/about/the-project/	Electric Nation aims to understand how the use of a variety of electric vehicles affects demand on the local electricity network. It is also exploring the use of smart and managed charging to minimise the stress of electric vehicles on the electricity network. Charging data is being collected from 678 participant customers in the WPD licence areas. Each participant is provided with a free smart charger and incentivised by payments that simulate time of use tariffs. The smart charging management system either slows or pauses charging during periods of peak energy demand. Demand management is shared fairly across all EVs that are plugged in. The trial will help us understand what customers think about smart charging systems, and how they influence charging behaviour. It will also tell us how effective the use of demand management using smart chargers is in comparison to network reinforcement. The results will give a better understanding of parts of the network that are likely to be affected by the adoption of EVs.	Better management of the local electricity network and reduction of stress on the network could allow more customers and generators to be connected to the grid. This could potentially allow more renewable energy to be generated by communities. Knowledge gained from this trial could potentially be used by communities to develop new revenue streams such as joining forces with a technical partner to aggregate the flexibility of electric vehicles to provide balancing services to the local electricity network. This could be done with car clubs or even with groups of private car owners that form a consortium.

Electric vehicle charging. Photo credit: Electric Nation

Visibility Plugs and Sockets

Project name	Description of project	Impacts of project on community energy groups
Visibility Plugs and Sockets **Company name** WPD **Project Partners** Centrica, National Grid, The University of Exeter **Funding** Network Innovation Allowance - £180k **What?** To develop a trading platform for flexibility services to enable buyers and sellers of flexibility to easily connect **Where?** WPD licence areas: South West, South Wales, West and East Midlands **When?** November 2017 - April 2019 **More information** https://www.westernpower.co.uk/Innovation/Projects/Current-Projects/Plugs-Socket-Project.aspx www.centrica.com/cornwall	The Visibility Plugs and Socket project runs in parallel with the Cornwall Local Energy Market, an EU funded initiative to create a local energy market and test the use of flexible demand, generation and storage with households and businesses. The aim of Visibility Plugs and Sockets is to investigate the benefits of using a trading platform for flexibility services connecting buyers and sellers. The project will explore optimising the selection of flexibility services depending on price, and other factors such as reliability and locality. WPD will then test the local flexibility market platform under several set conditions (i.e. seasons and business models). This will enable them to understand the impacts of buying flexibility at different timescales orvolumes on prices.	The platform could allow community groups to provide local flexibility services, especially if they own storage such as batteries or generation assets like hydro or wind. In the longer term the platform will be developed to support peer-to-peer trading. This is likely to allow new entrants to access the local flexibility services market. The sharing of information through the market platform will allow greater understanding of how the use of flexibility services by one party can impact another and is hoped to provide insight on the scale of potential conflicts and how these can be avoided. If the extent of flexibility in the system is increased it could allow more opportunities for new connections of low carbon technologies such as solar PV installations.

Community solar project. Photo credit: South West Water

Battery storage. Photo credit BSR and WPD

Entire

Project name	Description of project	Impacts of project on community energy groups
Entire **Company name** WPD **Project Partners** - **Funding** Network Innovation Allowance **What?** Using existing assets owned by businesses to enhance local flexibility **Where?** East and West Midlands WPD licence area **When?** April 2018 - March 2019 **More information** http://www.flexiblepower.co.uk/ https://www.westernpower.co.uk/About-us/News/New-Energy-Trial.aspx	Entire is a trial that aims to allow businesses in the Midlands area, to provide flexibility services to the local electricity network and be rewarded for doing so. WPD ran an expression of interest for local flexibility services in 14 Constraint Managed Zones, which closes in March 2019. Businesses are paid to reduce their electricity consumption or to increase their on-site generation in response to an automated signal. The automated signal is received through a piece of hardware which has been installed as part of the trial. For a business to be included in the trial, they have to be on a half-hourly electricity tariff, a tariff where electricity usage is automatically sent to the electricity provider every half an hour.	Service Partnership is being offered to aggregators who pool smaller generators or users together to provide the flexibility needed. Community energy groups could work with aggregators or other technical partners, to group small amounts of flexibility from multiple businesses and take part in the trial. By better balancing the local electricity network it can allow more consumers and generators to be connected. This could allow more community energy groups to get new projects connected to the local distribution network.

Biomass boiler. Photo credit Regen


Electricity monitoring equipment. Photo credit WPD

Please use the online form to complete this consultation:

Please click here to go to the online form

1. About you

Tell us about yourself and what part of the sector you represent:

1. Full Name:

2. Organisation:

3. Age range: ☐ 16-24 ☐ 25-49 ☐ 50+

4. Main area you represent:

Community energy group ☐

Company working with community energy organisations ☐

Consultant working with community energy organisations ☐

Local energy stakeholder (e.g. small-scale generator) ☐

Aggregator ☐

Other (please specify below): ☐

5. Contact email address:

6. Contact phone number:

7. Are you happy for us to contact you separately? ☐ Yes ☐ No

8. Would you like us to contact you to share the results of this consultation and keep you informed about future events and opportunities to engage with WPD? ☐ Yes ☐ No

5 Consultation Section 2: WPD's DSO principles

WPD's DSO strategy sets out 12 guiding principles for the transition to DSO. These have been prioritised through stakeholder consultation as follows:

1. Enabling efficient and economic whole system outcomes
2. Delivering maximum value to all customers, through optimised use of smart grid flexibility (e.g. voltage reduction, automated load transfer).
3. Facilitation of neutral markets that are open and accessible to all potential flexibility service providers, so they can compete with traditional network solutions, including as an alternative to reinforcement.
4. Using flexibility services to deliver quicker, more efficient and cheaper connections.
5. Minimisation of inefficient flexibility programmes with National Grid and others through conflict mitigation and management.
6. Economic and social benefits through maximisation of energy system availability (i.e. using technology to improve resilience)
7. We also recognise that the transition will be incremental. Allowing new capabilities and skills to be developed at a pace which is realistic, whilst enabling the areas in WPD most likely to benefit to be targeted first.
8. Delivering maximum value to individual customers offering network-provided flexibility services.
9. Level playing field across access for all customers. Equal participation by all customer groups in DSR programmes.
10. Maximisation of accessibility to services for all vulnerable customers.
11. Environmental benefits through minimisation of losses.
12. Provision of services where no market participants exist (for example storage for flexibility services).

- As a result, WPD will work closely with the ESO to ensure we are delivering efficient whole system outcomes as we move towards becoming a DSO.
- We will ensure that neutral markets are developed to make these opportunities available to all customers and that all customers benefit from the efficiency savings.
- WPD will not invest in smart grid flexibility services where the market can do so more economically.

9. Q. Do you want to participate in the transition to DSO?

10. Q. How do you want to participate, and which areas are of most interest?

11. Q. Are these principles correct?

12. Q. Is there anything missing?

6 Consultation Section 3: Flexibility services

The value of flexibility

Using smart technology, energy storage, alternative connections and behaviour change to closely monitor and manage variable energy generation and demand will ensure the network operates in the most optimal and efficient way. In some constrained areas this will be a more cost-effective solution than network upgrades.

Alternative connections

WPD is making the network we have more flexible by developing alternative connection solutions, enabling more people to connect low carbon technologies using different types of connections. These are:

1. Active Network Management – using control equipment to dynamically control the network, generation and demand.
2. Soft Intertrip – if an upstream asset needs reinforcement, or conditions limit export, monitoring means further capacity can be released under normal operating parameters, and the connection can be restricted to a predefined limit if the network is under pressure.
3. Timed – the generator cannot export at certain times defined in their connection agreement.
4. Export limited – the customer caps their import or export to the network.

You can find out more about alternative connection solutions here.

13. Q. Do you have enough information about alternative connection solutions?

14. Q. If not, what information do you need?

15. Q. Are you considering, or have you applied for an alternative connection? If yes, please give details:

16. Q. What could WPD do to make the process of applying for an alternative connection easier for you?

Signposting

Facilitating new neutral markets for flexibility is a key objective in WPD's DSO Strategy. WPD will proactively publish information to help customers understand where to connect to maximise system efficiency.

Signposting will include a map of where the resource is required, give customers an idea of the months/days/time/peak power (MW per month), and how much energy is required (MWh/per month).

WPD Network Capacity and Flexibility Maps

To support customers to think about where to develop new generation and storage projects, WPD uses an online ***Network Capacity Map,*** which is available at:

www.westernpower.co.uk/Connections/Generation/Network-Capacity-Map.aspx

Figure 3 – WPD online Network Capacity Map

The Network Flexibility Map has been developed to display where our network is currently seeking flexibility, or may seek it in the future.

www.flexibilitymap.westernpower.co.uk

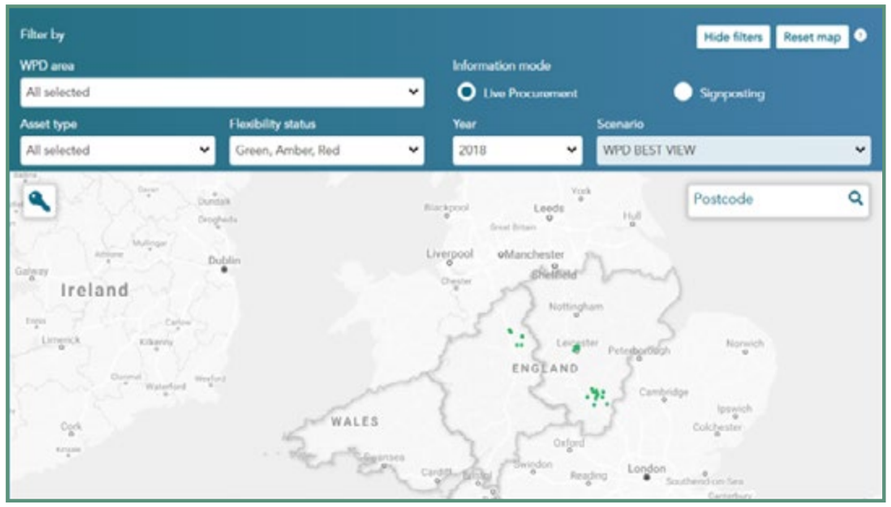


Figure 4 – WPD online Network Flexibility Map

17. **Q. Did you know these tools were available?**
18. **Q. Have you used either of them?**
19. **Q. Will you use them now?**
20. **Q. Do you have any feedback on these online tools?**

Customers can provide flexibility

Customers can play a part in constrained areas to defer network upgrades. The DSO will identify and procure flexibility services from customers who can turn up generation, discharge storage, and reduce demand. Identifying, contracting and operating these non-network services and solutions is at the centre of the DSO transition. These services could involve customers:

- Turning up demand – using more electricity when there is too much generation
- Turning down demand – using less electricity when there is a constraint on the network
- Turning up generation – increasing energy production
- Turning down generation – voluntary curtailment
- Using storage to shift consumption away from times of network and system congestion.

21. **Q. Are you interested in providing flexibility services to help balance the network?**
22. **Q. How much controllable demand/generation/storage do you or your organisation manage or have access to? Please state kW and/or kWh per annum.**
23. **Q. Do you or your organisation have any electricity storage? Please state the storage power rating (MW/kW) and capacity (MWh/kWh)?**

Neutral markets facilitation

WPD has to maintain a neutral market and be technology agnostic, but is interested in whether you have evidence that some technologies and customers are disadvantaged by the current approach and need more support, which could be presented to Ofgem.

24. Q. How should WPD facilitate neutral markets that will enable a level playing field for community and local energy stakeholders to participate?

25. Q. Is there anything that would stop you being able to provide flexible power to WPD?

26. Q. What can WPD do to help remove barriers that might prevent you participating in flexibility markets?

Access to multiple markets and stacking services

More coordination is needed between the transmission and distribution networks. DSOs are not the only people procuring flexibility, the ESO has well established services and there may be other purchasers in the future. These will have different needs to the DSO. Coordination is necessary to avoid confusing and conflicting information, and to ensure the whole system is used efficiently.

27. Q. Would you like to be able to provide services to both the national Electricity System Operator as well as the local Distribution System Operator?

28. Q. What do you need to make this easy for you, and are there any barriers that would prevent you stacking services?

Tendering process for Flexible Power

WPD is procuring flexible power to address five constraints in 18 zones, during winter 2018 and summer 2019, using the learning from the Flexible Power innovation project. WPD will continue to engage customers to learn and improve the process as it is rolled out eventually across all Constraint Managed Zones.

Find out more about Flexible Power here: www.flexiblepower.co.uk

The expression of interest document goes into more detail about how the process will work but there are some key elements we'd like your views on.

Expressions of interest will be sent out for Constraint Managed Zones and tenders for flexibility received. Following a capability assessment to ensure providers can meet the necessary requirements of tenders, contracts will be awarded in the Constraint Managed Zones where it is economic.

Flexible Power offers three services which are available to half-hourly metered organisations that can reduce their electrical consumption, or increase their on-site generation for at least two hours in response to an automated signal.

- Secure – designed to manage peak demand on the network and pre-emptively reduce network loading.
- Dynamic – developed to support the network in the event of specific fault conditions, often during summer maintenance periods.
- Restore – designed to help with network restoration following rare fault conditions.

29. Q. Is there a different way we could describe these services to make it easier for communities to engage?

Requirement windows are declared in advance to allow customers to stack other services when not required by Flexible Power.

30. Q. Is this table clear?

31. Q. Is there anything missing?

32. Q. Is there a different way we could present this to make it more useful?

	Secure	Dynamic	Restore
Advance Payment	Arming	Availability	None
Utilisation	Medium	High	Premium
Customer declaration	Week Ahead	Week Ahead	Week Ahead
FP Accept / Reject	Week Ahead	Week Ahead	Automatic Accept
Dispatch Notice	Week Ahead *	15 minutes	15 Minutes
Seasonal Requirement	All	Summer	All
Site Type	Half Hourly Metered	Half Hourly Metered	Half Hourly Metered
Generation	✓	✓	✓
Load Reduction	✓	✓	✓

* A 15 minute signal will also be provided

Figure 5 – WPD online table of requirement windows for flexible power

Where flexibility is needed

WPD will signpost the geographic boundary of the area(s) where flexibility is required using a map, available online at www.westernpower.co.uk/signposting

for example:

33. Q. Is this map clear?

34. Q. Is there anything missing?

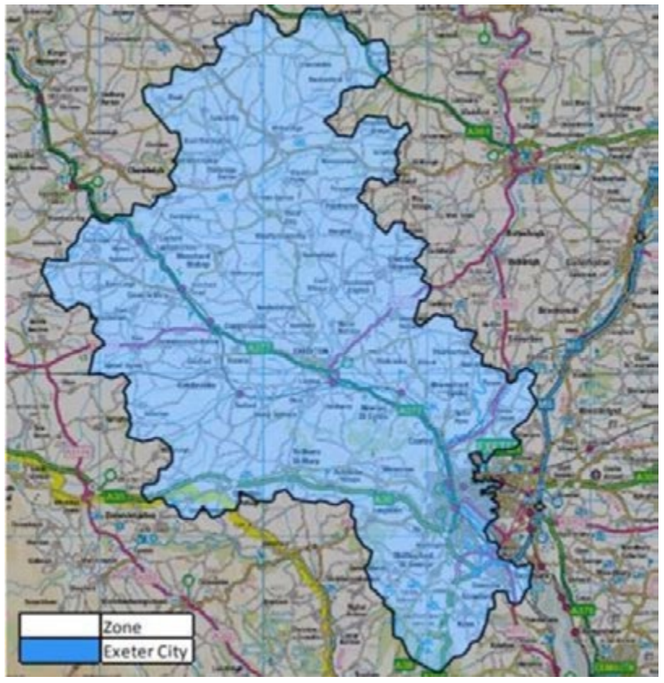


Figure 6 – WPD online map of where flexible power is required.

When, how often and how much flexible power is needed?

WPD will supplement the map with a diagram that shows the months/days/time/peak power (MW/ month), and how much energy is required (MWh/ month). For example:

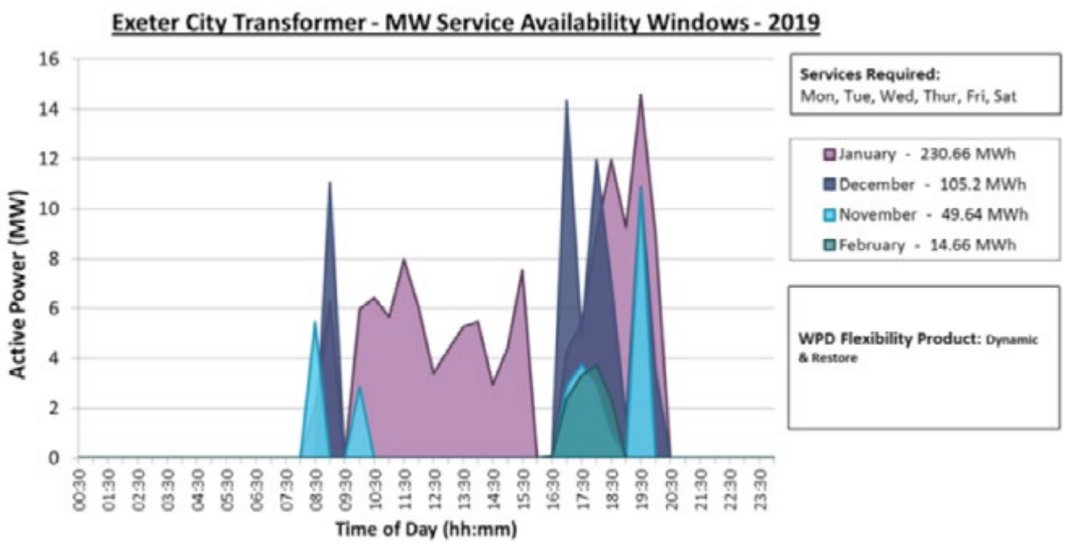


Figure 7 – WPD online graph of when, how often and how much flexible power is required

35. **Q. Is this diagram clear?**
36. **Q. Is there anything missing?**
37. **Q. Is there a different way we could present this to make it more useful?**
38. **Q. How long would you need a contract to be for you to participate in flexibility markets?**
39. **Q. To enable greater participation WPD has not set a minimum entry threshold but anticipate around 100 kW of flexibility and upwards being a viable amount. Do you have a view on entry thresholds?**

Payment rates

WPD will show the amounts they will pay for the types of flexibility in a table. The amounts in each zone will vary slightly and detailed pricing will be given in the Expression of Interest, for example:

	Arming	Availability	Utilisation
Secure	£75/MW/h or £118/MW/h	N/A	£150/MWh
Dynamic	N/A	£5/MW/h	£300/MWh
Restore	N/A	N/A	£600/MWh

Figure 8 – WPD online table of payment rates for flexible power

40. **Q. Is this table clear?**
41. **Q. Is there anything missing?**
42. **Q. Is there a different way we could present this to make it more useful?**
43. **Q. There are no penalties if someone does not deliver the amount of flexibility they said they would. Instead it's a sliding scale of reduced payment or no payment. Do you have a view about this approach?**

Metering

Flexible power contracts require minute-by-minute metering to give WPD sufficient visibility of the flexibility delivered. This is not part of the specification for SMETS 2 smart meters. The information is currently provided to WPD through an API (Application Programming Interface). This is a software to software link which avoids having to install additional hardware on site and provides near real time data to WPD.

44. **Q. Flexible power contracts will require minute-by-minute metering. Will you be able to provide that if you decide to participate, or do you have another solution?**

Ongoing engagement with WPD

45. **Q. How would you like WPD to engage with you in future?**
46. **Q. Is there anything else you want to talk to WPD about?**

Many thanks for taking the time to respond to these consultation questions.

7 Next Steps

Consultation process

As we stated at the start of this paper, WPD is doing this consultation to:

- support community energy organisations to develop knowledge about our changing energy system to encourage informed participation;
- find out what communities think and what their future energy plans are;
- use this information to inform WPD's ongoing engagement and capacity building support for community and local energy stakeholders going forward; and
- ensure WPD's vision for DSO is aligned with the needs of customers and stakeholders

WPD will use the information gathered to:

- Inform future network planning
- Refine the implementation of the DSO transition strategy
- Produce and publish a feedback report on responses

WPD values all feedback and information we receive through this consultation and we might need to follow up with you on some of your responses if you are happy to be contacted.

WPD will share the responses we receive with Regen and all information provided will be treated as confidential. Any results we publish will be anonymous, aggregated and summarised.

Many thanks for taking the time to fill in this consultation. If you have any questions please contact us on:

Email: wpdnetworkstrategy@westernpower.co.uk

Post: Network Strategy Team
Western Power Distribution
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This consultation has been developed in partnership with Regen.